WHAT IS CLAIMED IS:

1. A range finder comprising:

a projector unit for projecting linearly polarized light onto a subject;

at least one image input unit disposed in a position different in principal point from the projector unit; and

a polarizing direction selection unit for selecting light having a polarizing direction from light reflected by the subject, wherein

the at least one image input unit captures a reflected image based on the light selected by the polarizing direction selection unit from the light reflected by the subject and measures a 3D shape of the subject on the basis of the reflected image.

2. The range finder according to Claim 1, further comprising:

an identical principal point image input unit disposed on a principal point substantially identical in position to the principal point of the projector unit, wherein

the identical principal point image input unit captures a reflected image based on the light selected by the polarizing direction selection unit from the light reflected by the subject.

3. The range finder according to Claim 1, wherein:

the projector unit projects an encoded stripe pattern onto the subject;

the apparatus further includes a principal point displacement image input unit for displacing a principal point so that the principal point and the principal point of the projector unit are along a direction of the length of the stripe pattern; and

the principal point displacement image input unit captures a reflected image based on the light selected by the polarizing direction selection unit from the light reflected by the subject.

4. The range finder according to Claim 1, further comprising:

an angle adjustment unit for changing an angle of the polarizing direction selected by the polarizing direction selection unit, relative to the polarizing direction of the linearly polarized light.

5. The range finder according to Claim 4, wherein

the angle adjustment unit includes a rotation mechanism for rotating the projector unit.

6. The range finder according to Claim 4, wherein

the angle adjustment unit includes a rotation mechanism for rotating the polarizing direction selection unit.

7. The range finder according to Claim 1, wherein the polarizing direction selected by the polarizing direction selection unit is substantially perpendicular to the polarizing direction of the linearly polarized light in terms of angle.

8. The range finder according to Claim 4, wherein a reflected image based on light after specular-reflected light contained in the light reflected by the subject is removed by the angle adjustment unit is captured.

9. The range finder according to Claim 1, wherein the projector unit includes a light source, a light forming optical system, and a polarized light conversion optical system.

10. The range finder according to Claim 1, wherein the projector unit includes a light source, a light forming optical system, and a polarizing filter.

11. The range finder according to Claim 1, wherein a polarizing filter is used as the polarizing direction selection unit.

12. The range finder according to Claim 1, wherein light with a plurality of stripes encoded by use of the linearly polarized light is projected.

13. A range finder comprising:

a projector unit for projecting linearly polarized light onto a subject;

an identical principal point image input unit disposed in a position substantially identical to the position of the principal point of the projector unit;

at least one nonidentical principal point image input unit disposed in a position not identical to the position of the principal point of the projector unit; and

a polarizing direction selection unit for selecting light having a polarizing direction, wherein

the identical principal point image input unit and the at least one nonidentical principal point image input unit monitor only the light selected by the polarizing direction selection unit from light reflected by the subject and measure a 3D shape of the subject on the basis of images generated from the monitored light.

14. A 3D image acquired method comprising:

projecting linearly polarized light onto a subject;

selecting light having a polarizing direction from light reflected by the subject;

capturing a reflected image based on the selected light at a position different from the position of the principal point of the projecting of the linearly polarized light; and

measuring a 3D shape of the subject on the basis of the reflected image.

15. A 3D image acquired method comprising:

projecting linearly polarized light onto a subject;

selecting light having a polarizing direction from light reflected by the subject;

monitoring the selected light at a position substantially identical to the position of the principal point of the projecting of the linearly polarized light and a position not identical to the position of the principal point of the projecting of the linearly polarized light; and

measuring a 3D shape of the subject on the basis of images generated from the monitored light.